

BACKGROUND:

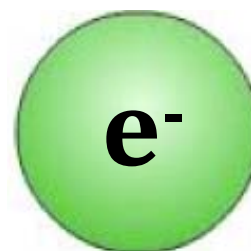
- Electricity is the **flow** of **charged particles** through a material.
- The charged particles we will focus on in class are **ELECTRONS**, which have a **NEGATIVE** charge.
- For this lab we will use **colored beads** to represent an **Electrons (e⁻)**...

ONE BEAD



=

ONE ELECTRON



LEARNING GOAL: That the motion/ movement of electrons effects rate at which energy can be delivered.

MATERIALS:

- 2 Glass Beakers (400mL)
- 200 Beads
- 1 Stopwatch
- 1 [1/2 meter stick (50cm)]
- 1 Cardboard card with a hole in the middle (approx 2cm)

PART 1: (Baseline)

- Place all 200 Beads into one of the 400mL beakers.
- Now separate the 400mL beakers by approx. 20cm.
- Now using the stopwatch, time for 1 minute while you transfer as many beads as you can into the other empty 400mL beaker. **(YOU CAN ONLY TRANSFER ONE BEAD AT A TIME!)**

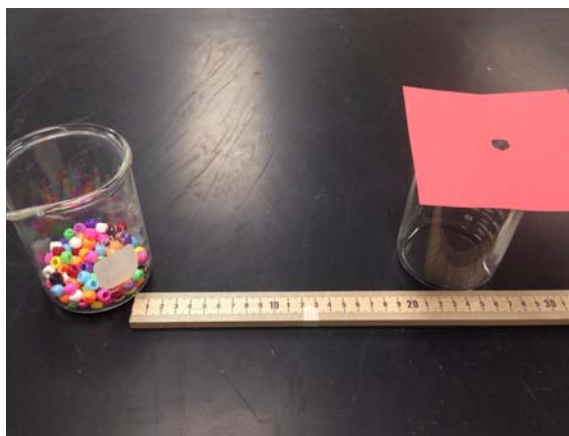
Number of beads transferred = _____

- Now that you have tried this, **REPEAT** the process above ... (This should be your other partner.)

Number of beads transferred = _____

Did you find anything different? (Number of beads? Was your process better?) Why? (What did you change? Why did it work better?)

PART 2: (Add the card)



- Place all 200 Beads back into one of the 400mL beakers.
- Now add the Cardboard card with a hole in the middle (approx 2cm), over top of the empty 400mL beaker.
- Keep 400mL beakers by approx. 20cm.
- Now using the stopwatch, time for 1 minute while you transfer as many beads as you can into the other empty 400mL beaker. **(YOU CAN ONLY TRANSFER ONE BEAD AT A TIME!)**

Number of beads transferred = _____

Did you find anything different from PART 1 (With No Card)?

Why? (What did you change? Why did it work better or worse?)

PART 3: (A DIFFERENT APPROACH)

- Place all 200 Beads back into one of the 400mL beakers.
- Start with the same setup that you started with in **PART 2**.
- Now take a couple of minutes to plan out how/what your group can change/do to increase the number of beads into the other 400mL beaker in 1 minute.

(YOU CAN ONLY CHANGE ONE THING!!!!)

<p>What is your group's change?</p> <p>Predict why this will help?</p>	<p>PLEASE DRAW A PICTURE OF YOUR NEW SETUP!</p>
---	--

Number of beads transferred = _____

- **REFLECT...** Did you group's idea work? Why or Why Not.

PART 4: (THE CHALLENGE)

- Place all 200 Beads back into one of the 400mL beakers.
- Start with the same setup that you started with in **PART 2**.
- Now take a couple of minutes to plan out how/what your group can change/do to move all the beads into the other 400mL beaker With NO time limit.

(YOUR GROUP WANTS TO BE THE FASTEST!)

<p>What are your group's changes?</p> <p>Predict why this will help?</p>	<p>PLEASE DRAW A PICTURE OF YOUR NEW SETUP!</p>
--	--

Time it took beads transferred = _____

- **REFLECT...** Did you group's idea work? Why or Why Not.

DID YOU MEET THE GOAL?

LEARNING GOAL: That the motion/ movement of electrons effects rate at which energy can be delivered.

SO... mark on the scale below you answer to the following statement.

I understand and could explain how the motion of electrons affects the rate of energy transfer in a system.

(1 = no clue, 5 = somewhat understand, 10 = Got it, move on)

1 2 3 4 5 6 7 8 9 10

WHEN YOU ARE DONE WITH EVERYTHING CHECK IN WITH MR. TIMA AND CLEAN UP!